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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,156	04/06/2006	Jouku Savolainen	LOYZ 200004US01	6845

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EXAMINER	
BADR, HAMID R	

ART UNIT	PAPER NUMBER
1794	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,156	SAVOLAINEN, JOUKU	
	Examiner	Art Unit	
	HAMID R. BADR	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 November 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 17-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 17-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Applicants' amendment filed on 11/25/2009 is acknowledged.

New grounds of rejection are set forth below.

Claims 1-15 and 17-20 are being considered on the merits.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-15 and 17-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

1. Claim 1 is indefinite for "modified protein". Claim 1 recites the limitation "modified protein" in line 3. There is insufficient antecedent basis for this limitation in the claim.

2. Claim 1and 11 are indefinite for "protein space network". It is not clear what is meant by this phrase. "protein space network" has been mentioned in the specification but is not defined.

3. Claim 8 is indefinite for "heating said mixture for 15 minutes or less to cause an interchange reaction by said free sulfhydryl groups to further cleave other disulfide bridges between the modified protein and protein in the protein containing food product to obtain free sulfhydryl groups". It is not clear what is meant by this phrase.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim1-3, 6-13, 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Craig et al. (US 3,876,805; hereinafter R1).

4. R1 discloses a method of making a modified protein having an unexpectedly high degree of sulfhydryl activity in the form of active available –SH groups. (Abstract)

5. R1 discloses improved whey protein concentrates which are both water soluble and gluten reactive in the sense of substantial sulfhydryl activity. (col. 3, lines 36-40)

6. R1 discloses that the functional properties of the whey concentrate are brought about by -SH groups and the modified protein has unusual degree of gluten reactivity. (col. 4, lines 45-50)

7. The breakage of disulfide bonds resulting in the generation of –SH groups is disclosed by R1 (col. 11, lines 40-50). Therefore, the requirement for the cleavage of at least one disulfide bond originally present in the unmodified protein, as presently claimed, is met.

8. As disclosed by R1, the modified whey protein is highly gluten reactive, therefore, when such a modified protein is added to a protein containing food e.g. dough, the active –SH groups, in the whey proteins, will interact with disulfide bonds in gluten

resulting in the formation of new disulfide bonds between the whey proteins and gluten as well as generation of new sulfhydryl groups as presently claimed. It is also noted that the formation of new disulfide bonds between the two proteins will result in the strengthening of the food structure as presently claimed. It is also noted that as the dough is heated in the baking process, the reaction of active –SH groups with disulfide bonds and other free -SH groups in the protein containing food will be accelerated.

9. The effect of heat treatment and oxidizing agents on –SH groups of whey lactoglobulin is disclosed by R1. (col. 1, lines 45-55)

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-15 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Craig et al. (US 3,876,805; hereinafter R1) in view of Savolainen (WO 99/55170; hereinafter R2)

12. R1 discloses a method of making a modified protein having an unexpectedly high degree of sulfhydryl activity in the form of active available –SH groups. (Abstract)

13. R1 discloses improved whey protein concentrates which are both water soluble and gluten reactive in the sense of substantial sulfhydryl activity. (col. 3, lines 36-40)

14. R1 discloses that the functional properties of the whey concentrate are brought about by -SH groups and the modified protein has unusual degree of gluten reactivity. (col. 4, lines 45-50)

15. The breakage of disulfide bonds resulting in the generation of –SH groups is disclosed by R1 (col. 11, lines 40-50). Therefore, the requirement for the cleavage of at least one disulfide bond originally present in the unmodified protein, as presently claimed, is met.

16. As disclosed by R1, the modified whey protein is highly gluten reactive, therefore, when such a modified protein is added to a protein containing food e.g. dough, the active –SH groups, in the whey proteins, will interact with disulfide bonds in gluten resulting in the formation of new disulfide bonds between the whey proteins and gluten as well as generation of new sulfhydryl groups as presently claimed. It is also noted that the formation of new disulfide bonds between the two proteins will result in the strengthening of the food structure as presently claimed. It is also noted that as the dough is heated in the baking process, the reaction of active –SH groups with disulfide bonds and other free -SH groups in the protein containing food will be accelerated.

17. The effect of heat treatment and oxidizing agents on –SH groups of lactoglobulin is disclosed by R1. (col. 1, lines 45-55)

18. R1 discloses sulfite salts for generating sulfhydryl groups in foods. (Col. 13, lines 26-35)

19. While R1 discloses the details of modified whey protein having reactive –SH groups which are available for protein-protein interactions, R1 is silent regarding the use of sulfite ion forming reagent to generate –SH groups in the protein being modified.

20. R2 discloses the modification of whey and soy proteins by sulfonation of one or both of the sulfhydryl groups involved in a disulfide bond. The liberated sulfhydryl groups will make the modified protein more functional regarding emulsification, gellation, foaming etc. (page 9, lines 9-16)

21. R2 discloses that free sulfhydryl groups can bring about the cleavage of disulfide bonds generating new sulfhydryl groups such that the interaction of the sulfhydryl groups of the modified protein and the new sulfhydryl groups will generate intermolecular disulfide bonds creating protein nets. (page 9, lines 18-22)

22. R2 discloses that the formed sulfhydryl groups can be oxidized using oxidizing agents at temperatures of 45-75C. (page 9, lines 24-27).

23. R2 discloses the modification of whey proteins and soy proteins by sulfites. (page 10).

24. R2 discloses how the degree of sulfitolysis desired is achieved when whey proteins are modified. (page 11, lines 16-19).

15. R1 discloses the details of modifying whey proteins through generating active sulfhydryl (-SH) groups. R1 also teaches of the reactions of free sulfhydryl groups with other proteins such as gluten. R2 discloses how to generate –SH groups using sulfite ion forming agents such as sodium sulfite. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make reactive whey

proteins as disclosed by R1 by modifying the teachings of R1, regarding the generation of –SH groups, using the methods of sulfitolysis as disclosed by R2. One would do so to alter the functional properties of proteins or the functional properties of foods containing such modified proteins. Absent any evidence to contrary and based on the combined teachings of the cited references, there would be a reasonable expectation of success in preparing the modified proteins and incorporate them into other protein containing foods as presently claimed.

Response to Arguments

Applicants' arguments are moot in light of the new grounds of rejection necessitated by amendments.

Conclusion

25. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Petrucelli, S. et al. 1995. Partial reduction of soy protein isolate disulfide bonds. J. Agric. Food. Chem. 43: 2001-2006. This article gives the details of sulfitolysis of soybean protein isolates and the generation of free sulfhydryl groups in the modified protein.

26. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HAMID R. BADR whose telephone number is (571)270-3455. The examiner can normally be reached on M-F, 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks can be reached on (571) 272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hamid R Badr
Examiner
Art Unit 1794

/Keith D. Hendricks/

Supervisory Patent Examiner, Art Unit 1794